

Claims

1. Unit for automatic container recycling apparatuses for returning containers in a lying position, particularly bottles or cans, by means of a conveying device (7, 8) with a conveyor belt (9) for advancing the containers in the direction of the longitudinal axis thereof, and with rotating rollers (1, 2) that are provided with a surface area (5) and can be moved from a neutral position into an identifying position in which the rotating rollers disengage the container from the conveying device (7, 8) and make the container rotate, characterized in that
 - a. the rotating rollers (1, 2) are each embodied as hollow elements and are provided with at least one breakthrough (6) in the longitudinal direction,
 - b. at least one conveying device (7, 8) is disposed in the rollers (1, 2), respectively, and the conveyor belt (9) is arranged in the area of the breakthrough (6),
 - c. the rotating rollers (1, 2) and the conveying device (7, 8) are mounted separately, the surface area (5) of the rollers (1, 2) overlapping the conveyor belt (9) of the conveying device (7, 8) when the rotating rollers (1, 2) are rotated.
2. Unit according to claim 1, characterized in that the conveyor belts (9) of the conveying devices (7, 8) are arranged in v-shape.
3. Unit according to claim 1 or 2, characterized in that the conveyor belt (9) is guided around turn around rollers (10) that are attached to supports (14).
4. Unit according to one of the foregoing claims, characterized in that the rotating rollers (1, 2) are provided with a gear rim (16) on the front side thereof which are driven by a gear wheel (18).
5. Unit according to claim 4, characterized in that the gear wheel (18) is driven by a motor (19).
6. Unit according to one of the foregoing claims, characterized in that the rollers (1, 2) can be moved from a neutral position, in which the breakthroughs (6) are located directly above the conveyor belts (9) with the conveyor belts (9)

forming a v-shaped groove for receiving and advancing the container (11), into an identifying position when rotating in the same direction around the axis (3, 4) thereof, in which identifying position the container (11) is released from the conveyor belts (9), arrives on the rotating surface areas (5) of the rollers (1, 2) and is rotated here.

7. Unit according to one of the foregoing claims, characterized by a detection unit for detecting an identification feature of the container (11) during rotation of the container (11) on the rollers (1, 2).
8. Unit according to one or several of the foregoing claims, characterized in that the rotating rollers (1, 2) are made of lamellar segments (20) disposed in the longitudinal direction of the rollers (1, 2).
9. Unit according to claim 8, characterized in that the segments (20) are substantially bent circularly.
10. Unit according to one or several of the foregoing claims, characterized by a coupled belt drive (22) for driving the conveyor belts (9) of the conveying devices (7, 8).
11. Unit according to one or several of the foregoing claims, characterized in that the surface area (5) of the rotating rollers (1, 2) is provided with a coating.
12. Apparatus for recycling containers with an inlet unit for returning containers in a lying position, particularly bottles or cans according to one or several of claims 1 to 11.
13. Method for handling containers in a lying position, such as cans or bottles, having the following features:
 - a container can be laid on a conveying device comprising a first conveyor (7) and a second conveyor (8) each having one conveyor belt (9), wherein the conveyor belts (9) substantially form a v-shape,
 - the contour of the container is detected by means of a container detecting unit,
 - the container is moved from a first position, lying on the conveyor belts (9), into a second position, lying on the surface areas of two rotating rollers (1, 2) and being rotated by them,

- the bearings (15) of the rotating rollers (1, 2) are arranged stationarily in the relative position to one another,
- a code reader detects an identification code located on the container,
- depending on the detection of the identification code, the container in the first position is either guided to a place located upstream of the conveyors (7, 8),
- or the container is transported back to a position located downstream of the conveyors (7, 8) or a loading position,

characterized in that

- the rotating rollers (1, 2) are each embodied as hollow elements and are provided with a breakthrough (6) in the longitudinal direction in the surface area (5),
- the first conveyor (7) and the second conveyor (8) are arranged inside the rotating rollers (1, 2) and are stationary in the relative position to one another,
- and in that the respective surface areas of the rotating rollers (1, 2) overlap the conveyor belts (9), lifting the container from the conveyor belts (9) and rotating it when the rotating rollers (1, 2) are rotated.

14. Method according to claim 13, characterized in that

- a testing device determines whether or not an identification code is detectable on the container in the first position,
- the container is conveyed to the place located upstream of the conveyors (7, 8) or to the loading position if the identification code is detectable,
- the container is moved into the second position if the identification code is not detectable, and the container is rotated for detecting the identification code, and wherein the container is then moved back into the first position.

15. Apparatus for handling containers in a lying position, such as cans or bottles, comprising:

- a first conveyor (7) and a second conveyor (8), each having one conveyor belt (9), wherein the conveyor belts (9) are movable in a parallel direction,
 - conveyor belts (9) substantially forming a v-shape,
 - 5 - a pair of rotating rollers (1, 2), the rotational axes thereof pointing into the direction of movement of the conveyor belts (9) and having the same rotational direction,
 - a container being moved from a first position, lying on the conveyor belts (9), into a second position, lying on the surface area of the rotating rollers (1, 2) and being rotated by them,
 - 10 - a detection unit being provided for detecting characteristic features of the container,
 - wherein the apparatus guides the container in the first position either to a place located upstream of the conveyors (7, 8) or back to a position downstream of the conveyors (7, 8),
 - 15 - and wherein the bearings (15) of the rotating rollers (1, 2) are arranged stationarily in the relative position to one another,
 - characterized in that
 - each rotating roller (1, 2) is embodied as a hollow element und has a breakthrough in the longitudinal direction in the surface area thereof,
 - 20 - the first conveyor (7) and the second conveyor (8) are arranged inside the rotating rollers (1, 2) and are stationary in the relative position to one another,
 - and in that the respective surface areas of the rotating rollers (1, 2) overlap the conveyor belts (9), lifting the container from the conveyor belts (9) and rotating it when the rotating rollers (1, 2) are rotated.
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16. Apparatus according to claim 15, characterized in that the rotating rollers (1, 2) do not rotate during detection of the characteristic feature of the container contour.

17. Apparatus for handling containers in a lying position, such as cans or bottles, having the following features:

- 5 - a container is attachable to a conveying device comprising a first conveyor (7) and a second conveyor (8), each having one conveyor belt (9), wherein the conveyor belts (9) substantially form a v-shape,
- the contour of the container is detected by means of a container detecting unit,
- 10 - the container is moved from a first position, lying on the conveyor belts (9), into a second position, lying on the surface areas of two rotating rollers (1, 2) and being rotated by them,
- the bearings (15) of the rotating rollers (1, 2) are arranged stationarily in the relative position to one another,
- a code reader detects the identification code located on the container,
- 15 - depending on the detection of the identification code, the container in the first position is either guided to a place located upstream of the conveyors (7, 8),
- or the container is transported back to a position located downstream of the conveyors (7, 8) or a loading position,
- characterized in that
- 20 - the rotating rollers (1, 2) are each embodied as hollow elements and are provided with a breakthrough (6) in the longitudinal direction in the surface area (5),
- the first conveyor (7) and the second conveyor (8) are arranged inside the rotating rollers (1, 2) and are stationary in the relative position to one another,
- 25 - and in that the respective surface areas of the rotating rollers (1, 2) overlap the conveyor belts (9), lifting the container from the conveyor belts (9) and rotating it when the rotating rollers (1, 2) are rotated.

18. Apparatus according to claim 17, characterized in that

- a testing device determines whether or not an identification code is detectable on the container in the first position,
- the container is conveyed to the place located upstream of the conveyors (7, 8) or to the loading position if the identification code is detectable,
- 5 - the container is moved into the second position if the identification code is not detectable, and the container is rotated for detecting the identification code, and wherein the container is then moved back into the first position.